

Claims

What is claimed is

1. A cut of a piezoelectric oscillator comprising:

a quartz plate having an electric axis on an X axis, a mechanical axis on a Y axis, and an optic axis on a Z axis, said plate having a side parallel to an X' axis established by rotating the X axis in a clockwise direction about the Z axis within an angle of from about 3 to 30 degrees, said quartz plate further having a side parallel to a Z' axis obtained by rotating the Z axis about the X' axis in the clockwise direction within an angle of from about 33 to 36 degrees,

wherein the quartz plate has sides parallel to an X'' axis and a Z'' axis, respectively, which have been rotated within angles of from about -35 to -2 degrees in the clockwise direction about the Y axis that is a thickness direction of the cut of the piezoelectric oscillator.

2. A cut of a piezoelectric oscillator as set forth in claim 1, wherein when a rotational angle about the Z axis, a rotational angle about the X' axis, and a rotational angle about the Y' axis are defined to be ϕ degrees, θ degrees, and Ω degrees, respectively,

Equation 1

$$\Omega^{\circ} = (-0.0037 \times \phi^3 + 0.1106 \times \phi^2 \\ -1.161 \times \phi + 0.239 \pm 3)^{\circ} \\ (\text{ wherein, } 3.0 \leq \phi \leq 30)$$

is satisfied.

3. A piezoelectric oscillator comprising:
the cut of the piezoelectric oscillator as set forth in
claim 1.

4. A piezoelectric device having a piezoelectric
oscillator as set forth in claim 3.